UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,387	04/19/2001	Juan G. Gonzalez	2925-0495P	7292

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EXAMINER
KIM, KEVIN

ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 07/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	**Applicant(s)**
Office Action Summary	09/837,387	GONZALEZ ET AL.
	Examiner	**Art Unit**	
	Kevin Y. Kim	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>18 July 2006</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-7 and 9-12* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5 and 9-12* is/are rejected.

7)☒ Claim(s) *6,7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

    1.☐ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

2.   This application currently names joint inventors. In considering patentability of the

claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c)

and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3.   Claims are rejected under 35 U.S.C. 103(a) as being unpatentable over Piirainen (US

6,748,031, previously cited) in view of Kim et al (US 6,868,112 previously cited but not used).

Claims 1 and 2.

Piirainen discloses a method of estimating a communication channel (see Fig.2),

comprising;

"determining at least first and second confidence levels that a transmitted

data symbol has respective first and second values based on a received data

symbol corresponding to the transmitted data symbol," (see col. 3, line 66 ~ col.4, line4

describing the confidence levels or probabilities of a received symbol y having one of a plurality

of values x);

"generating a channel estimate based on the first and second confidence

levels over a time window of predetermined width," (see col.4, lines 32-49 describing the

calculation of a channel estimate using the probabilities of a received symbol y having one of a

plurality of values x, and col.3, lines 51-54) and

generating an overall channel estimate by obtaining an average of a plurality of channel

estimates. See col. 4, lines 60-63.

Piirainen fails to teach the average is a weighted average. Kim et al teaches obtaining a

weighted average of channel estimates, each over a slot (i.e., "time window"). The weighted

average is more accurate particularly when the channel condition is time-varying.

Thus, it would have been obvious to use the weighted average of the channel estimates in

Piirainen's channel estimation for the purpose of more accurate channel estimate, as taught by

Kim et al.

Claim 3.

The calculation of a channel estimate is based on the confidence levels of the received

symbols since it used the mean of the probabilities/confidence levels as well as the received data

symbol y_k. See the equation at col.4, lines 35-40.

Claim 5.

Referring to Fig.2, Piirainen discloses a method of making a channel estimate,

comprising:

"generating a confidence factor according to a confidence function and a

received data symbol, the confidence factor representing a confidence level that a

transmitted data symbol corresponding to the received data symbol has a

particular symbol value," (see col. 3, line 66 ~ col.4, line 4 describing probabilities of a received

symbol y having one of a plurality of values x, i.e., the confidence factor according to "a

confidence function," i.e., a Viterbi detecting function, see col.3, line 66 ~ col.4, line 4);

"generating a channel estimate based on the confidence factor and the

received data symbol over a time window of predetermined width." (see col.4, lines 32-49

describing the calculation of a channel estimate using the probabilities of a received symbol y

having one of a plurality of values x and col.3, lines 51-54.) and

"generating an overall channel estimate by obtaining a weighted average of a plurality of

channel estimates." (see col. 4, lines 60-63)

Piirainen fails to teach the average is a weighted average. Kim et al teaches obtaining a

weighted average of channel estimates, each over a slot (i.e., "time window"). The weighted

average is more accurate particularly when the channel condition is time-varying.

Thus, it would have been obvious to use the weighted average of the channel estimates in

Piirainen's channel estimation for the purpose of more accurate channel estimate, as taught by

Kim et al.

Claim 9.

Referring to Fig.2, Piirainen discloses a method of making a channel estimate,

comprising:

"determining a strength indicator based on a received data symbol

corresponding to a transmitted data symbol, a value of the strength indicator

indicating a likelihood that the transmitted data symbol is a particular value," (see col. 3, line 66

~ col.4, line 4 describing probabilities of a received symbol y having one of a plurality of values

x, i.e., "a strength indicator" of the received symbol);

"generating a channel estimate based on the confidence factor and the

received data symbol over a time window of predetermined width 1." (see col.4, lines 32-49

describing the calculation of a channel estimate using the probabilities of a received symbol y

having one of a plurality of values x and col.3, lines 51-54) and

"generating an overall channel estimate by obtaining a weighted average of a plurality of

channel estimates." (see col. 4, lines 60-63)

Piirainen fails to teach the average is a weighted average. Kim et al teaches obtaining a

weighted average of channel estimates, each over a slot (i.e., "time window"). The weighted

average is more accurate particularly when the channel condition is time-varying.

Thus, it would have been obvious to use the weighted average of the channel estimates in

Piirainen's channel estimation for the purpose of more accurate channel estimate, as taught by

Kim et al.

Claims 10 and 11.

Piirainen teaches a binary modulation, one of which is the bi-phase shift keying, where a transmitted symbol obtains the values of 1 or –1. See col. 4, lines 22-24. Thus, the strength indicator, i.e., a numeral representation of probability, approaches a value of 1 the greater the likelihood that the transmitted data symbol was 1 and approaches a value of -1 the greater the likelihood that the transmitted data symbol was -1.

Claim 12.

The claim calls for performing the probability determinations and the strength indicator determination according to a predetermined function. Piirainen teaches describing computing the probabilities according to a Viterbi detecting function. See col.3, line 66 ~ col.4, line 4

Allowable Subject Matter

4.   Claims 6 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US patent no.6,724,828 describes a weighted average of channel estimates.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y. Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

July 25, 2006

AU 2611

/Kev (Lm/

**KEVIN KIM
PATENT EXAMINER**